CLAIM AMENDMENT

Please enter the following amendment to the claims, which is presented in accordance with 37 C.F.R. §1.121.

What is claimed is:

1. (**Currently amended**) A system for analyzing an anomalous condition, comprising:

a process for producing a product, including:

plural subprocesses for performing operations on the product,

wherein each subprocess includes at least one actuator for controlling the respective subprocess,

wherein each subprocess includes at least one sensor for measuring information pertaining to the status of the respective subprocess, and for generating an output based thereon;

a parameter extractor for, for each of the subprocesses, receiving the output from the at least one sensor, and for generating at least one representative value that is characteristic of a pattern expressed in the output, the parameter extractor thus generating a plurality of representative values for the process as a whole;

a knowledge base for storing data including a plurality of representative values, and also including information which maps the representative values to associated anomalous conditions;

an analyzer for analyzing the plurality of representative values output from the parameter extractor with respect to the data stored in the knowledge base, and for generating a diagnostic

2

result which diagnoses an anomalous condition in the process, and also identifies at least one of the subprocesses which has caused the anomalous condition; and

control logic for using the diagnostic result to affect corrective action to the at least one ~~the subprocesses~~subprocess which has caused the anomalous condition by adjusting at least one actuator that controls the at least one subprocess.

2. **(Original)** The system of claim 1, wherein the process is for manufacturing metal, plastic extrusion or paper-based products.

3. **(Original)** The system of claim 1, wherein the process is for manufacturing metal products, and the process includes the following subprocesses:

a hot rolling subprocess for reducing the thickness of the metal products in a heated state;

a pickling subprocess for removing unwanted material from the metal products;

a cold rolling subprocess for reducing the thickness of the metal products in a cold state using a plurality of rolling stands; and

an annealing subprocess for heating and subsequently cooling the metal product.

4. **(Original)** The system of claim 1, wherein the analyzer is configured to provide a diagnosis based on samples taken from the at least one sensor for one discrete product.

5. **(Original)** The system of claim 1, wherein the analyzer is configured to generate summary values for respective discrete products, and to provide a diagnosis based on the summary values.

3

6. **(Original)** A system for analyzing an anomalous condition in a process for producing a product, the process including plural subprocesses for performing operations on the product, wherein each subprocess includes at least one actuator for controlling the respective subprocess, and wherein each subprocess includes at least one sensor for measuring information pertaining to the status of the respective subprocess, and for generating an output based thereon, comprising:

a parameter extractor for, for each of the subprocesses, receiving the output from the at least one sensor, and for generating at least one representative value that is characteristic of a pattern expressed in the output, the parameter extractor thus generating a plurality of representative values for the process as a whole;

a knowledge base for storing data including a plurality of representative values, and also including information which maps the representative values to associated anomalous conditions;

an analyzer for analyzing the plurality of representative values output from the parameter extractor with respect to the data stored in the knowledge base, and for generating a diagnostic result which diagnoses an anomalous condition in the process, and also identifies at least one of the subprocesses which has caused the anomalous condition.

7. **(Original)** The system of claim 6, wherein the process is for manufacturing metal, plastic extrusion or paper-based products.

8. **(Original)** The system of claim 6, wherein the process is for manufacturing metal products, and the process includes the following subprocesses:

a hot rolling subprocess for reducing the thickness of the metal products in a heated state;

a pickling subprocess for removing unwanted material from the metal products;

4

a cold rolling subprocess for reducing the thickness of the metal products in a cold state using a plurality of rolling stands; and

an annealing subprocess for heating and subsequently cooling the metal product.

9. **(Original)** The system of claim 6, wherein the analyzer is configured to provide a diagnosis based on samples taken from the at least one sensor for one discrete product.

10. **(Original)** The system of claim 6, wherein the analyzer is configured to generate summary values for respective discrete products, and to provide a diagnosis based on the summary values.

11. **(Original)** A method for analyzing an anomalous condition in a process for producing a product, the process including plural subprocesses for performing operations on the product, comprising:

for each of the subprocesses, providing sensor output from at least one sensor used to measure information pertaining to the status of the respective subprocess;

for each of the subprocesses, extracting at least one representative value that is characteristic of a pattern expressed in the output, thus generating a plurality of representative values for the process as a whole;

retrieving data from a knowledge base, the data including a plurality of representative values, and also including information which maps the representative values to associated anomalous conditions;

5

Application Serial No.: 10/609,628
Attorney Docket No.: 57761.000188

analyzing the plurality of representative values output from the parameter extracting step with respect to the data stored in the knowledge base, and for generating a diagnostic result which diagnoses an anomalous condition in the process, and also identifies at least one of the subprocesses which has caused the anomalous condition; and

using the diagnostic result to affect corrective action to the at least one of the subprocesses which has caused the anomalous condition by adjusting at least one actuator that controls the at least one subprocess.

12. (Original) The system of claim 11, wherein the process is for manufacturing metal, plastic extrusion or paper-based products.

13. (Original) The method of claim 11, wherein the process is for manufacturing metal products, and the process includes the following subprocesses:

a hot rolling subprocess for reducing the thickness of the metal products in a heated state;

a pickling subprocess for removing unwanted material from the metal products;

a cold rolling subprocess for reducing the thickness of the metal products in a cold state using a plurality of rolling stands; and

an annealing subprocess for heating and subsequently cooling the metal products.

14. (Original) The method of claim 11, wherein the analyzing step is configured to provide a diagnosis based on samples taken from the at least one sensor for one discrete product.

6

15. **(Original)** The method of claim 11, wherein the analyzing step is configured to generate summary values for respective discrete products, and to provide a diagnosis based on the summary values.

16. **(Original)** A method for analyzing an anomalous condition in a process for producing a product, the process including plural subprocesses for performing operations on the product, where each of the subprocesses provides sensor output from at least one sensor used to measure information pertaining to the status of the respective subprocess, the method comprising the steps of:

for each of the subprocesses, extracting at least one representative value that is characteristic of a pattern expressed in the output of the at least one sensor, thus generating a plurality of representative values for the process as a whole;

retrieving data from a knowledge base, the data including a plurality of representative values, and also including information which maps the representative values to associated anomalous conditions; and

analyzing the plurality of representative values output from the parameter extracting step with respect to the data stored in the knowledge base, and for generating a diagnostic result which diagnoses an anomalous condition in the process, and also identifies at least one of the subprocesses which has caused the anomalous condition.

17. **(Original)** The method of claim 16, wherein the process is for manufacturing metal, plastic extrusion or paper-based products.

7

18. **(Original)** The method of claim 16, wherein the process is for manufacturing metal products, and the process includes the following subprocesses:

a hot rolling subprocess for reducing the thickness of the metal products in a heated state;

a pickling subprocess for removing unwanted material from the metal products;

a cold rolling subprocess for reducing the thickness of the metal products in a cold state using a plurality of rolling stands; and

an annealing subprocess for heating and subsequently cooling the metal products.

19. **(Original)** The method of claim 17, wherein the analyzer is configured to provide a diagnosis based on samples taken from the at least one sensor for one discrete product.

20. **(Original)** The method of claim 16, wherein the analyzer is configured to generate summary values for respective discrete products, and to provide a diagnosis based on the summary values.